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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,861	07/10/2001	Anhui Liang		5992

7590 10/28/2004

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EXAMINER

PHAN, HANH

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/900,861

Applicant(s)

LIANG ET AL.

Examiner

Hanh Phan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 07/26/2004.

Drawings

2. The drawings are objected to because **the blank boxes in Figures 3, 4 and 5 should be labeled. For example, in Figures 3, 4 and 5, the blank boxes 31, 32, 33, 35, 36, 37, 38, 41, 43, 44, 45, 46, 50, 51, 52, 54, 55, 56 and 57 should be labeled .**

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features **“dispersion length is at least two times larger than nonlinear length”** and **“an optical attenuator after said normal dispersion fiber”** and **“an optical filter after said normal dispersion”** specified in the claims 1 and 2 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 1, 9 and 20, the phrase **"dispersion length is at least two times larger than nonlinear length"** is not described in the specification.

In claim 2, the phrase **"an optical attenuator after said normal dispersion fiber"** is not described in the specification.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-10, 12-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Franco et al (US patent No. 6,538,788).

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Regarding claims 1, 10 and 20, referring to Figures 1, 2a, 2b and 3, Franco discloses a method to improve the system performance Q factor of a high speed optical fiber transmission an optical fiber transmission system by

generating a RZ format at a transmitter (As indicated in Figures 1 and 3, generating a RZ format at a transmitter TX 5, col. 10, lines 3-34),

transmitting said RZ format over a dispersion managed optical transmission medium (As indicated in Figures 1 and 3, transmitting the RZ format over a dispersion managed optical transmission medium 8, col. 10, lines 3-34 and col. 11, lines 15-60),

transferring said RZ format to a NRZ or quasi-NRZ format in front of a receiver by an optical pulse transformer which takes advantage of high nonlinear Kerr effect in normal dispersion fiber for pulses with a power (As indicated in Figures 1, 3, 2a and 2b, transferring the RZ format to a NRZ or quasi-NRZ format in front of a receiver (i.e., RX 14, Fig. 1) by an optical pulse transformer (i.e., nonlinear filter NLF 15, Fig. 1, col. 13, lines 34-67, col. 16, lines 24-52 and col. 18, lines 42-58) which takes advantage of high nonlinear Kerr effect in normal dispersion fiber for pulses with a power,

then detecting the NRZ or quasi-NRZ format at the receiver (i.e., receiver RX 14, Fig. 1).

Franco differs from claims 1, 10 and 20 in that he does not specifically teach dispersion length is at least two times larger than nonlinear length. Franco teaches dispersion length is L-18'b and nonlinear length is L-18'b. However, it would have been obvious to obtain dispersion length is at least two times larger than nonlinear length in

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order to reduce the noise signal, increase the signal to noise ratio and to improve the performance of the system.

Regarding claim 3, Franco further teaches the optical pulse transformer (i.e., nonlinear filter NLF 15, Fig. 1) can improve the Q factor by increasing tolerances of both amplitude fluctuation and generalized timing jitter.

Regarding claim 4, Franco further teaches the optical pulse transformer (i.e., nonlinear filter NLF 15, Fig. 1) can act as a polarization mode dispersion compensator to compensate the PMD penalty induced from ISI (col. 18, lines 42-58).

Regarding claims 5 and 10, Franco further teaches the optical RZ pulse can be but not limited to be the format of dispersion managed soliton, conventional soliton, chirped RZ, non-chirped RZ, carrier-suppressed RZ, and carrier-suppressed chirpedRZ etc. (Fig. 1, col. 10, lines 3-34).

Regarding claims 6 and 12, Franco further teaches wherein the dispersion managed optical transmission medium includes transmission fibers, inline dispersion compensation units, optical amplifiers and other units such as a predispersion compensation unit in or after said transmitter and a post dispersion compensation unit before the pulse transformer (Fig. 1, col. 11, lines 31-67 and col. 12, lines 1-65).

Regarding claim 7, Franco further teaches the system can be used to install a new system, or to upgrade an existing system by adding more channels, or to replace some degraded channels (Fig. 1).

Regarding claim 8, it would have been obvious to obtain the quasi-NRZ format is flat top pulse with duty ratio of 1:3 to 1:1 in order to reduce the noise signal, increase the signal to noise ratio and to improve the performance of the system.

Regarding claim 13, Franco further teaches the optical fiber transmission system can be the noise limited system or/and the generalized timing jitter limited systems (Fig. 1).

Regarding claim 14, Franco further teaches the optical fiber transmission can be point to point systems, ring networks or mesh networks (Fig. 1).

Regarding claim 15, Franco further teaches the optical fiber transmission system can be WDM system or single-wavelength system (Fig. 3).

Regarding claim 16, Franco further teaches the optical pulse transformers can transform either the optical RZ pulses of single wavelength channel or multiple wavelength channels to NRZ pulses (Figs. 1 and 3).

Regarding claim 17, Franco further teaches the optical RZ pulses in front of the optical pulse transformers can be either with or without frequency chirp (Figs. 1 and 3).

8. Claims 2 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Franco et al (US patent No. 6,538,788) in view of Golovchenko et al (US Patent No. 6,243,181).

Regarding claims 2 and 19, Franco further teaches wherein the optical pulse transformer (i.e. NLF 15, Fig. 1) consists of an optical amplifier (21)(Figs. 2a and 2b), a normal dispersion fiber 18 (Fig. 2a).

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Franco differs from claims 2 and 19 in that he does not specifically teach an optical filter between the optical amplifier and the normal dispersion fiber. However, Golovchenko teaches an optical filter (30) between the optical amplifier (10) and the normal dispersion fiber (40)(Fig. 2, col. 4, lines 3-29). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the optical filter between the optical amplifier and the normal dispersion fiber as taught by Golovchenko in the system of Franco. One of ordinary skill in the art would have been motivated to do this since Golovchenko suggests in column 4, lines 3-29 that using such an optical filter between the optical amplifier and the normal dispersion fiber has advantage of allowing filtering the noise signal, increasing the signal to noise ratio and improving the performance of the system.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Franco et al (US patent No. 6,538,788) in view of Suzuki et al (US Patent No. 6,459,518).

Regarding claim 11, Franco differs from claim 11 in that he does not specifically teach the optical RZ pulses of each wavelength channel can have either two orthogonal polarization sub-channels or two co-polarization sub-channels at same wavelength. However, Suzuki teaches the optical RZ pulses of each wavelength channel can have either two orthogonal polarization sub-channels or two co-polarization sub-channels at same wavelength (Fig. 5, col. 6, lines 53-67 and col. 7, lines 1-44). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the optical RZ pulses of each wavelength channel can have either two

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orthogonal polarization sub-channels or two co-polarization sub-channels at same wavelength as taught by Suzuki in the system of Franco. One of ordinary skill in the art would have been motivated to do this since Suzuki suggests in column 6, lines 53-67 and col. 7, lines 1-44 that using such the optical RZ pulses of each wavelength channel can have either two orthogonal polarization sub-channels or two co-polarization sub-channels at same wavelength have advantage of allowing reducing the interference between the signals.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Franco et al (US patent No. 6,538,788) in view of Webb (US Patent No. 6,163,394).

Regarding claim 18, Franco discloses all the aspects of the claimed invention except fails to teach the receiver includes a decision circuit. However, Webb in US Patent No. 6,163,394 teaches an optical receiver includes a decision circuit (Figs. 1, 2 and 4, col. 2, lines 35-44). Therefore, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the receiver includes a decision circuit as taught by Webb in the system of Franco. One of ordinary skill in the art would have been motivated to do this since Webb suggests in column 2, lines 35-44 using such a receiver includes a decision circuit has advantage of allowing reducing the bit error rate and to improve the system performance.

Response to Arguments

11. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

A handwritten signature in cursive script, appearing to read 'Hanh Phan', is written over a horizontal line.

Hanh Phan

10/26/2004